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ABSTRACT

This report reviews literature on the effects of maternal alcohol consumption on the fetus and the resulting impact on the learning abilities and behavior of children born with fetal alcohol syndrome (FAS). Recent reports indicate that an estimated 73 percent of infants are exposed to alcohol before birth, resulting in varying degrees of learning disabilities, developmental delays, and behavior problems that have a lifelong impact on the child's ability to learn and socialize with peers. Specifically, this report examines alcohol and substance abuse in rural communities; the developmental stages of children with FAS or fetal alcohol effect; terminology used in describing, defining, or explaining the effects of alcohol on learning and behavior; teaching and classroom management strategies for working with rural FAS students; differences between students whose primary behavioral disturbance is chemically related and those with an emotional disturbance; and descriptions of current programs and strategies for substance abuse intervention/prevention in youth and adolescent populations. Strategies and recommendations focus on overcoming limitations in rural communities due to time and distance as well as lack of financial resources. Also discusses recommendations for further research in rural communities. Contains 45 references. (LP)

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FETAL ALCOHOL SYNDROME (FAS), FETAL ALCOHOL EFFECTS (FAE): IMPLICATIONS FOR RURAL CLASSROOMS

Abstract

The purpose of this report is to review the literature to examine the effects of alcohol upon the unborn child, the child's brain, and resulting impact on the child's learning abilities and behavior. Current strategies for preventing children and adolescents from using and abusing alcohol and drugs will be addressed. The report will conclude with descriptions of currently recommended, researched classroom strategies, a case study of applied classroom strategies, and recommendations for additional research. Information shared will be of interest to classroom teachers, parents, and educational administrators as it focuses on the needs and interventions for serving this population of students.

In a recent study drawing on 27 published reports and National Institute on Drug Abuse data, Gomby and Shiono (1991) found an estimated 73% of infants are exposed to alcohol before birth. Because of the effect of alcohol on the brain of the unborn child, the resulting varying degrees of learning disabilities, developmental delays, and behavior problems have a lifelong impact on the child's abilities to learn and socialize with peers. The disruptiveness of these conditions result in a variety of implications for an entire classroom when students suffering from these disabilities are included in the class, whether it is the special education classroom or the regular classroom setting integrating students of all abilities. The full extent of effects of alcohol on children exposed *in utero* may never be known. (See Shaywitz, Cohen, and Shaywitz, 1980.)

The goals of this report are to review the literature to:

1) Examine the teratogenicity of alcohol and its effects on the development of the unborn child as reported in studies by Jones & Smith, 1973; Streissguth, Barr & Martin, 1984; Streissguth & LaDue, 1987; Streissguth, April, 1990; U.S. Dept. of Health, 1990; Webb, 1992; Black, 1993; and others;

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2) Examine alcohol and substance abuse in the rural communities as addressed by Helge, 1989; Helge, 1991, and Cole, 1993;

3) Discuss the developmental stages of children with FAS/FAE as observed by Streissguth, LaDue, & Randels, 1988; and reported by Wicker, 1990; Webb, 1992;

4) Review comments on terminology used in describing, defining, or explaining the effects of alcohol on learning and behavior as discussed by Sokol & Clarren, 1989;

5) Find teaching and classroom management strategies for working with rural students who may have disabilities resulting from exposure to alcohol in utero for rural educational settings as suggested by Rathbun, 1990; Groves, Ed., 1990; Van Dyke & Fox, 1990; Fox & Forbing, 1991; Burgess, & Streissguth, 1991; and Stevens & Price, 1992. The birth of a child with FAS signals a high-risk child in a high-risk environment. The child is at risk for failure to thrive, neglect and abuse, developmental delay, hyperactivity, behavioral problems, and learning problems;

6) To differientiate between students whose primary (behavioral) disturbance is chemically related from those for whom it is an emotional disturbance. Strategies for screening, referral and interventions as addressed by Medina and Hogan-Gancarz (1992) are presented.

7) Finally, to search for current programs and strategies for substance abuse intervention/prevention in youth and adolescent populations in rural and urban communities as suggested by Bush & Iannotti, 1993; Kandel & Yamaguchi, 1993; Elickson, Bell, & McGuigan, 1993; Dryfoos, 1993; and Moore & Forster, 1993; and others.

Recommendations for further research in rural communities will be shared. Strategies and recommendations will focus on the limitations of resources caused by time and distance as well as lack of available financial resources faced by rural communities (Camp & Thompson, 1992; Perry & Harmon, 1992; Howley, 1992; and Hutto & Cooper, 1992), and ways to compensate for those limitations. Rural parents and families will find many classroom strategies helpful and supportive (Elrich, 1990; Dorris, 1989).

Goal No. 1

Alcohol And Its Effects On The Development Of The Unborn Child

Lemoine and colleagues in 1968 and Jones and Smith in 1973 discussed a pattern of "altered growth and morphogenesis" in a number of infants born to alcoholic mothers. Jones and Smith (1973) called the disorder "fetal alcohol syndrome" thereby coining the term which would remain the discriptor of a condition found in far too many newborn children (p. 999). In listing the abnormalities of the eleven babies in their study, Jones and Smith found the following:

Abnormalities.

- **performance:** prenatal growth deficiency (11), postnatal growth deficiency (10), and developmental delay (10);

- **Craniofacies:** microcephaly (abnormally small cranial capacity) (10), short palpebral fissures (eyelid fissures) (11), epicanthal folds (small fold of skin covering the inner corner of the eye as in many Asian peoples) (4), maxillary hypoplasia (arrested growth of the upper jaw) (7), cleft palate (2), micrognathia (very little protrusion of the jaw) (3).

- **Limbs:** joint anomalies (limitation of motion of elbow, among the bones forming the fingers and toes (interphalangeal), and the five bones between the wrist and the fingers (metacarpal-phalangeal), and/or hip joints (8), and altered palmar crease pattern (crease(s) in the palm) (8);

- **Other:** cardiac anomalies (7), anomalous external genitalia (4), Capillary hæmangiomata (4), and fine-motor dysfunction (tremulousness, weak grasp, and/or poor eye/hand coordination) (9) (Jones & Smith, 1973).

The above characteristics have remained typical of infants and children who are exposed to alcohol *in utero.* Ulleland (cited in Heminway, 1988) found a marked resemblance in the facial features and size of a number of infants born to mothers who were heavy alcohol users. She found evidence of mental retardation as well (Heminway, 1988).

Webb (1992), in discussing embryonic development, suggests that damage to the cell membrane may be a reason for alcohol's effect on the unborn child, as much as any damage that may occur to the chromosomes. Because all of the major external and internal structures of the fetus develop in the period from conception through 8 weeks, this is a critical time for the child if alcohol or any other developmental interruption is a factor (Heminway, 1988; Van Dyke & Fox, 1990; Dominguez, Vila-Coro, Slopis, & Bohan, 1991; and Bateman, Ng, Hansen, & Heagarty, 1993).

Streissguth, Barr, and Martin (1984) hypothesized "that prenatal exposure to alcohol [could] produce long lasting deficits in the human nervous system and that the effects [were] dose-related (p. 177). Streissguth (cited in Rivard, 1979) found that children with FAS were small with "head circumferences below the third percentile". Other symptoms included mental retardation, "persisting growth deficiency of length, weight, and brain" (Streissguth, Herman, & Smith, 1978), and delayed development. Behavioral characteristics include hyperactivity, distractible with short attention spans, difficulty with learning, usually cooperative, and acquiescent with a childlike naivete (Streissguth, et al., 1978).

Streissguth et al., (1984) hypothesized that "the effects of alcohol on behavior [could] be assessed" within the first and second days of life. Streissguth, et al., (1984) rationalized that "fetal alcohol syndrome (FAS) [represented] the most severe end of a continuum of central nervous system (CNS) damage produced by alcohol exposure *in utero*" (p. 177) suggesting the existence of lesser effects of *in utero* exposure to alcohol. Streissguth, et al., argued that FAS infants were "born only to mothers who [were] chronic alcoholics and drinking heavily during pregnancy (p. 117). Other researchers argued regarding dosage and amount of effects at even lower rates of alcohol consumption. The debate has continued to vary throughout the 1970's and 1980's. It was "recommended that pregnant women not consume more than 2 oz. of alcohol daily (Rivard, 1979). Recent findings have shown that effects vary with individuals and that no generic recommendation can be made except that women who are pregnant should refrain from drinking at all for even moderate amounts of alcohol pose a risk to the unborn child (Koop, 1986). Moderate alcohol abuse is characterized by Jones (cited in Little, Gilstrap, & Cunningham, 1990) as "daily consumption of four to six drinks, or 2 to 3 ounces of alcohol. Outright alcoholism is defined by eight or more drinks, or 4 ounces of absolute alcohol or more, per day" (p.4).

One of the major effects of alcohol on the fetus is in the abnormal growth of the brain. Dr. Sterling Clarren tells of Christie Ulleland's discovery of fetal alcohol syndrome in 1970 when, as a resident physician, Ulleland noticed similarities in children born to mothers who were heavy alcohol users (Heminway, 1988). The babies were small, suffered mental retardation, and had similar facial features.

Dr. William J. Schull of the Radiation Effects Research Foundation discusses brain development in the research of the effects nuclear bombs on the survivors' descendants of Hiroshima and Chernoble. Apparently, the critical time of brain development is from 8 to 16 weeks. The neurons are forming at a rate of about 250,000 per minute. Glial cells form webs of fibers and the neurons crawl along the webbing to their final destination. The brain cells do not migrate haphazardly, Dr. Schull tells us. They have an address and migrate to that address in a highly choreographed series of events. The brain cells have to be in the right position to do the right thing. When alcohol interferes with the neurons during the critical growth period, the neurons continue past their destinations resulting in a scrambling of the different components of brain cells beyond the normal surface of

the brain, smoothing out the normal convolutions of the brain configuration. The result is neurons in the wrong places, and unable to do the right thing that would normally be required of them, resulting in mental retardation of the victim (Heminway, 1988, and Streissguth, Landesman-Dwyer, Martin, & Smith, 1980).

A number of researchers continued to confirm the disturbing effects of alcohol on the fetus of alcoholic women as it related to birth defects and infant development (Clarren, 1981; Furey, 1982; Golden, Sokol, Kuhnert, & Bottoms, 1982; Holzman, 1983; Iosub, Fuches, Bingol, & Gromisch, 1981; Kavale & Karge, 1986; Nitowsky, 1982; and Streissguth, Darby, Barr, Smith, & Martin, 1982). Because it is preventable by abstaining during pregnancy, advice to pregnant mothers and urging public health agencies regarding education of physicians, hospital employees, and the general public was recommended by most (Clarren, 1981; Furey, 1982; Holzman, 1983; Kavale & Karge, 1986; and Nitowsky, 1982).

In the fall of 1985, Streissguth, Clarren, and Jones (1985) completed a follow-up evaluation of the initial 11 children diagnosed as having fetal alcohol syndrome. (See Jones & Smith, 1973.) One child had drowned at 3 and a half, another refused to be examined, yet another had been lost to followup for 10 years, another died at 5 days old. Four of the remaining eight were attending regular classes with some help. The others were in special classes for the mentally impaired. The four more seriously disabled continue to need sheltered environments. Two of the mildly impaired individuals remained with their natural families and were experiencing social/emotional and school attendance problems (Streissguth, Clarren, & Jones, 1985; Jones, 1986).

Goal No. 2

Alcohol and Substance Abuse in Rural Communities

"If alcohol were introduced now, it would be a prescription drug of the highest order. So would caffeine" (Cole, Sept. 20, 1993). The disease concept of addiction (to alcohol): "Alcoholism is a primary, progressive disease that is not curable but is treatable. It can effect anyone. The true alcoholic needs treatment to get control" (Cole, 1993, Sept. 20).

Topping the list of characteristics used to operationally define "at-risk student(s)", Helge has placed substance abuse. At the bottom of the same list is disability. Between those characteristics, Dr. Helge included other characteristics of depression/suicide/low self-esteem, child abuse, child of alcoholic or substance abuser, illiteracy, and school dropout, among others. Dr. Helge defined rural as "a district in which the 'number of inhabitants are fewer than 150 per square mile, or located in a county in which 50% or more of the population lives in communities of 5,000 or fewer'" (Helge, 1991, p. 42). In her discussion of the results of the survey, she found 11.8% of the children with disabilities were children of an alcoholic parent. Twelve-point-two of the non-disabled were children of an

alcoholic parent. Most at-risk students displayed more than one of the at-risk characteristics. It was found that low self-esteem and/or the existence of a dysfunctional (distressed) family overlay other characteristics (Helge, 1991). These two characteristics combine to make a discouraging environment in which the at-risk child must struggle to survive. A serious consequence for these children is their own use of alcohol to ease feelings of worthlessness and loneliness (Harrigan, 1987).

In the project designed to enhance self-esteem for at-risk students, the case study reveals alcoholic parents or caregivers who use alcohol or drugs to be a factor in 4 out of 12 cases. Sexual activity, either abusive or by choice, is a factor in 5 of the 12 cases. Many of the students exhibit characteristics that could be connected to FAS or FAE. Three are apparently ruled out of FAS/FAE because they are described as "bright" (Helge, 1989, Spring). Belatedly, it might be productive to evaluate the students for alcohol or drug exposure *in utero*.

With the prevalence of alcohol as a socially accepted form of entertainment and/or activity, it seems reasonable to examine the possibility that many children with mild to severe mental retardation and/or learning disabilities might be victims of exposure to alcohol *in utero*.

Goal No. 3

The Developmental Stages of Children with FAS/FAE

Certain characteristics change in all persons as they mature. It is true, also, of the person exposed to alcohol *in utero*. Streissguth & LaDue (1987) list the developmental problems in FAS. They discuss behavior problems which will have an impact on the child's school progress and socialization. Among these problems are hyperactivity, eating problems, stuttering/stammering, reduced clarity of speech, clumsiness in upper limbs and lower limbs, dependency, hearing impairment, heart problems, head and body rocking, impaired concentration, and phobias. Delays in motor development and language development will also impact the child's school performance.

Infants.

Babies with FAS are small and scrawny in appearance. They are often irritable and tremulous, (Streissguth, et al., 1988) may display weak sucking, poor feeding, hyperexcitability, and fitful sleeping (Streissguth & Giunta, 1988). They may continue to lose weight longer than usual after birth (Streissguth, et al., 1988). Such infants are frequently subject to illnesses, failure to thrive, and evaluation of heart or other physical defects (Streissguth, et al., 1988 and Streissguth & Giunta, 1988).

When FAS babies remain in the care of the biologic mothers who continue to drink, they are at high risk of abuse and neglect (Streissguth, et al., 1988). Alcoholic mothers may simply be unable to provide care and nurturing for the FAS child. Mothers who are heavy alcohol abusers are, themselves, at risk of alcohol-related physical disorders and poor health, in general (Streissguth & Giunta, 1988).

Fetal alcohol infants, as a group, are mentally handicapped and will likely have slow motor, language, and physical development. Older infants are usually cooperative, have child-like naivete which can threaten their safety, are acquiescent and compliant. They are often clumsy, impulsive, and unrestrained. They exhibit short attention spans, fidgetiness, and inattentiveness (Hill, Hegemier, & Tennyson, 1989).

Preschool years.

FAS children remain small, short, and elf-like in manner and appearance (Streissguth, et al., 1988; Streissguth & Giunta, 1988). They are alert, friendly, with butterfly-like movements, like to be touched, and usually have a happy disposition. While hyperactive, the child may exhibit developmental delays, especially in the richness of speech, though excessive talking is typical (Streissguth, et al., 1988).

Early school years.

School may be delayed a year or kindergarten repeated due to developmental delays in speech, motor development, and hyperactivity. The most obviously mentally impaired are usually diagnosed during this period and spend much of their time in special education environments. Mathematical concepts with their abstract approaches are usually more difficult than language skills. Attention deficits become more obvious and critical as the demand for concentration increases. Poor peer relations and social isolation are not uncommon due to poor impulse control and social intrusiveness (Streissguth, et al., 1988).

In exploring behavior and learning difficulties, Shaywitz, Cohen and Shaywitz (1980) looked for subtle indications in a group of children who were having behavior and learning problems in school, but had not necessarily been identified as FAS or FAE. This group was examined for indications of prenatal exposure to alcohol. Shaywitz, et al., (1980) indicated their findings suggested carefully following the children of alcoholic mothers "through the early school years for the possibility of learning difficulties" (p. 978) and that "children experiencing school failure should be evaluated for indications of prenatal exposure to ethanol" (alcohol) (p. 979). In the group they examined, all of whom were in the normal range of intelligence (82-113 I.Q.'s), all were experiencing school failure, all but one were described as hyperactive, having a short attention span, distractibility, and an inability to function without intensive one-to-one or small group activity. Thirteen of the fifteen were referred for special education services by the first

grade; all were recommended for special education by third grade. Their findings provided support that milder degrees of central nervous system dysfunction were frequently encountered in children of alcoholic women.

Middle school years.

School achievement usually reaches maximum by this time, with more strength in reading and spelling, and less ability in the abstracts of arithmetic. Maintaining attention becomes increasingly difficult. The need to master new academic skills increases stress and reduces attendance. Proper evaluation and educational/ vocational placement during these years increases the student's success later on. Low adaptive skills and poor intellectual development make them high-risk for inability to live independently (Streissguth, et al., 1988).

Adolescence.

Certain behaviors common to FAS/FAE children seem to intensify with age. Learning disabilities cannot be fixed. Poor judgement and inability to understand fully the consequences of their actions, they seem to have limited conception of the future or the capacity to learn from experience (Staff, 1990, November). They have limited understanding of moral issues, not seeming to pay particular note of praise or blame (Staff, 1990). Its unlikely that they will be able to live independently (Black, 1993). They require much patience and need clear and consistent limits on their behavior with immediate correction and consequences when breaking the rules. Retaining information is difficult for them (Staff, 1990).

Fetal alcohol syndrome results in a predictable, long-term progression of the disorder into adulthood. Maladaptive behaviors are the greatest difficulty in the treatment (Streissguth, Aase, Clarren, Randels, LaDue, and Smith, 1991).

Goal No. 4

Terminology Used In Describing The Effects of Alcohol.

In 1989, Sokol and Clarren set about their goal of providing a set of guidelines for use by investigators, care givers, researchers, and others to establish consistency when reporting the results of scientific study.

Fetal alcohol syndrome (FAS).

Defined as patients with abnormalities in: (a). prenatal/ postnatal growth retardation, (b). central nervous system involvement, and (c). a characteristic face (Sokol & Clarren, 1989). Abnormalities in all three categories are necessary for a complete diagnosis of FAS (Sokol & Clarren, 1989).

Alcohol related birth defect (ARBD).

ARBD is suggested because it connotes attribution of the observed anatomic result to the child to the consumption of alcohol by the mother (Sokol & Clarren, 1989).

Possible Fetal alcohol effects (FAE).

FAE means only that alcohol is being considered as one of the possible causes of a patient's birth defects. It has been misused to mean a birth defect judged milder than FAS. But this has been inconsistently documented. There has been no consensus on an acceptable way to use the term or to define it (Sokol & Clarren, 1989).

Goal No. 5

Teaching and Classroom Management Strategies for Students With FAS/FAE

Antonia Rathbun (1990) capsulizes FAS or FAE students as:

- often needing reteaching due to memory deficits;
- heavily dependent upon the daily routine or schedule due to sequencing impairment. Rearranging the classroom environment causes them anxiety because they are strongly environmentally cued (visual/kinesthetic hypersensitive);
- unable to follow verbal directions because they have audio processing deficits;
- having low motivation and high distractibility;
- having difficulty in transitioning from one classroom activity to another (state rigidity);
- having difficulty keeping up with activities that move faster than they are (tracking problems);
- tending to resist the rules due to emotional and perceptual perseveration and inability to create and maintain an internal structure or discipline;
- having oversensitivity to stimulus (distractibility), hypersensitive to criticism and difficulty finishing tasks;
- experiencing fatigue from regular stimulus level of the classroom and show exhaustion after a typical school day (psychic exhaustion);
- taking three times as long to do homework or classwork (slow cognitive pace);
- showing hypersensitivity to touch, taste, texture, or sound;
- seeming younger than their peers (developmental delays);
- exhibiting some form of sleep disturbance;
- having inability to gauge cause and effect (impaired predictive skills) but can be trained to use deductive logic;
- poor at selecting potential choices;
- easily frustrated and needing frequent encouragement;

- wanting to please, believing they can't; and
- not knowing why their brains don't seem to work right and get even more confused when they try harder. They need to try differently.

While early intervention helps, these children are not just learning disabled.

They are victims of lifelong disabilities caused by prenatal brain damage. Teaching functional "daily living skills" focusing on present and future living environments (Burgess & Streissguth, 1992) will assist students to become as independent as possible. Teaching communication skills and social skills are also essential.

Keeping the class size small and creating a safe, structured, stress-reduced environment is essential for them to learn (Black, 1993). Have few classroom rules and highly structured teacher-directed activities (Cole, Jones, & Sadofsky, 1990). "... Help children develop new coping strategies before removing the current ones" (Griffith, 1992, p. 34).

Specific classroom strategies.

Patricia Tanner, Ph.D. has prepared a listing of methods/strategies for educating children with ADD. These strategies are effective with children with FAS/FAE. She gives five keys to working with children with attention deficit disorders: structure, persistence, consistency, brevity, and variety.

Goal No. 6.

Differentiating Between Students Whose Primary (Behavioral) Disturbance is Chemically Related.

In 1992, Medina and Hogan-Gancarz conducted a survey using the Personal Experience Screening Questionnaire (PESQ) to differientiate between students whose behavior problems were chemically related and those whose behavior was the result of emotional problems.

The results indicated that 37% of the students enrolled in Behavior Intervention Classes (BIC) might be at-risk for chemical dependency. Some evidence of psychological distress were also reported. Results also suggested that the PESQ might be a valid instrument for evaluating the chemical use of both regular and special education students (Medina & Hogan-Gancarz, 1992).

Goal No. 7

Programs and Strategies for Substance Abuse Prevention/ Intervention.

Student populations which are vulnerable to substance abuse include the special education student. Preventative measures which can be taken to counteract such vulnerability include:

1. Education about drugs and their effects;
2. Affective skill building;
3. Development of recreational skills;
4. Appropriate modeling by adults;
5. Enhanced communication and support systems.

The Office for Substance Abuse Prevention (OSAP), U.S. Department of Health and Human Services publishes Prevention Monographs which list programs that have proven effective. OSAP Prevention Monograph-3. Prevention Research Findings, 1988 covers research perspectives, School-based prevention programs, community-based prevention programs, health promotion and wellness programs, and public policy prevention programs. OSAP Prevention Monograph-5. Communicating About Alcohol and Other Drugs: Strategies for Reaching Populations At Risk talks of various populations considered at-risk for substance abuse. These include families and youth from high-risk environments, Black inner-city youth, Hispanic-Latino youth, parents, primary care physicians, and working with intermediary organizations. Publications are available from the National Clearinghouse for Alcohol and Drug Information, P.O. Box 2345, Rockville, MD 20852, 1-800-729-6686. OSAP also publishes the Citizen's Alcohol and Other Drug Prevention Directory which lists resources for getting involved. It is available through the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. For programs that are already in place, see the Prevention Plus II Tools for Creating and Sustaining Drug-Free Communities.

A local program that works is the "The Care Network, a student and employee assistance program for prevention, intervention, and aftercare services to students and employees who are at risk for engaging in self-destructive behaviors" (Fullerton, 1991). The program provides interventions and support groups, training and workshops, which assist educators and students to understand and change destructive relationships.

Discussion

Whether FAS/FAE children thrive is impacted by the home environment in which they exist. In some cases, children were left with their natural families. In many cases, children are placed in foster homes or adopted. Adoptive parents, if the prebirth condition is unknown, can find themselves in extremely traumatic situations with children whose behaviors are, at the least, extremely trying

(Blakeslee, 1990; Dorris, 1989; M. Dorris, personal communication, July 31, 1990; R.McGuire, personal communication, 1990).

Native American populations seem to be especially vulnerable to the occurrence of FAS/FAE in infants (Dorris, 1989; Streissguth, et al., 1988; Kolata, 1989; Streissguth, LaDue, & Randels, November, 1987). Proper care, programming and training cannot eradicate the basic disability of children with FAS, but they can be crucial factors in the quality of life they are able to achieve (Streissguth et al., 1987, November).

Ann Streissguth (1986) warns

> The birth of a child with FAS should signal a high-risk child in a high-risk environment. The child is at risk for failure to thrive, neglect and abuse, developmental delay, hyperactivity, and learning problems. The mother is at risk for alcohol-related disorders and early death if she continues to abuse alcohol. (p. 224)

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